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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,610	01/24/2002	Joseph M. Brand	MIO 0051 V2	1537
7590	02/03/2005		EXAMINER	
Killworth, Gottman, Hagan & Schaeff, L.L.P. Suite 500 One Dayton Centre Dayton, OH 45402-2023			CHAMBLISS, ALONZO	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**Application No. **10/056,610**

Applicant(s)

BRAND, JOSEPH M.

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 30,32-34,40-45 and 50-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30,32-34,40-45 and 50-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. 2/1/05.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The amendment filed on 11/23/04 has been fully considered and made of record in the instant application.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 30, 32-34, 40-45, and 50-53 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 32-34 and 50-53 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. In claim 32, the phrase " a second resin laminate layer over said continuous resin laminate layer, so as to define an underlying cavity " is vague and indefinite since it is not clear from the claim where the underlying cavity is located.
6. In claim 32, the phrase " a third resin laminate layer over said second resin laminate layer, so as to define a void portion over said underlying cavity " is vague and indefinite since it is not clear from the claim where the void portion is located.

7. In claim 32, the phrase " a fourth resin laminate layer over said third resin laminate layer, so as to define a void portion over said third resin laminate layer " is vague and indefinite since it is not clear from the claim where the void portion is located.
8. In claim 32, the phrase " an upper conductive layer over said fourth resin laminate layer, so as to define a void portion over said fourth resin laminate layer " are vague and indefinite since it is not clear from the claim where the void portion is located.
9. In claim 32, the phrase " a solder resist layer over said upper conductive layer, so as to define a void portion over said upper conductive layer " is vague and indefinite since it is not clear from the claim where the void portion is located.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 32-34 and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hegel (U.S. 5,255,157) in view of Juskey et al. (U.S. 5,336,931).

With respect to Claims 32, 40, and 44, Hegel discloses a substrate 10 with a plurality of individual layers (i.e. first, second, third, and four laminate layers), wherein all of the layers have a void 21 (i.e. cavity) that is over the void of the other plurality of layers. The plurality of individual laminate layers is over one another and have lower, middle, and upper conductive layers interposed between respective laminate layers. An

upper conductive layer is over the fourth laminate, so as to define a void portion over the void 21 portion of the fourth laminate layer. A die 13 is placed over the at least one upper conductive laminate layer, wherein the die is encapsulated by forming encapsulant over the at least one upper conductive laminate layer, over the die and in the void 21 (see col. 2 lines 59-68, col. 3 lines 1-68, col. 4 lines 1-26; Fig. 4). Hegel fails to disclose forming a solder resist layer over the conductive layer, so as to define a void portion over the void portion of the conductive layer and wherein the laminates are resin. However, Juskey discloses forming a solder resist layer over the substrate 160, so as to define a void portion over the void portion. The at least one resin layer is formed from bismaleimide triazine laminate (i.e. resin)(see col. 3 lines 20-25). The solder resist when attached to the laminate of Hegel would be over the conductive layer, so as to define a void portion over the void portion of the conductive layer. Thus, Hegel and Juskey have substantially the same environment of a substrate with a substrate with a via hole filled with encapsulant. Therefore, it would have been obvious to incorporate the solder resist with the process of Hegel, since the solder resist would facilitate the formation of metal patterns on the laminate that are used as connection areas for bonding wires extending from the chip as taught by Juskey.

With respect to Claims 33, 41, and 42, Hegel discloses wherein the underlying cavity 21, the void 21 portion of the third laminate layer, the void 21 portion of the fourth laminate layer, the void portion 21 of the conductive layer taught by Hegel and the void portion 150 of the solder resist layer taught by Juskey are formed to collectively form a void (see Figs. 2 of Juskey and Fig. 4 of Hegel).

With respect to Claim 34, Juskey discloses placing a die 130 over at least a portion of the solder resist layer 180 and forming an encapsulant 110 over the solder resist layer 180, over the die 130, and in the void 150 (see Fig. 2).

With respect to Claim 43, Hegel discloses wherein the encapsulant 16 is formed in substantially the entire void 21 (see Fig. 4).

12. Claims 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hegel (U.S. 5,255,157) and Juskey et al. (U.S. 5,336,931) as applied to claim 40 above, and further in view of Papathomas (U.S. 5,623,006).

With respect to Claim 45, Hegel-Juskey both fail to disclose wherein the at least one resin layer is formed from FR-4 epoxy-glass laminate. However, Papathomas discloses wherein the at least one resin layer is formed from FR-4 epoxy-glass laminate (see col. 8 lines 35-45). Therefore, it would have been obvious to substitute the FR-4 epoxy glass for the material of the laminate taught by Hegel-Juskey, since substrates made of FR-4 epoxy glass perform well at high temperatures as taught by Papathomas.

### ***Double Patenting***

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 30, 32-34, 40-45, and 50-53 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,423,581. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of the patent recites first conductive layer (i.e. lower conductive layer of the instant application in claims 30, 32, and 40) and a second conductive layer (i.e. second conductive layer of the instant application in claims 30, 32, and 40).

The prior art made of record and not relied upon is cited primarily to show the process of the instant invention.

### ***Conclusion***

15. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571) 272-1927.

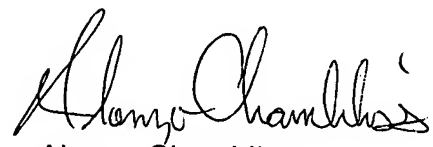
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status

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information for unpublished applications is available through Private PMR only. For more information about the PMR system see <http://pair-dkect.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or [EBC\\_Support@uspto.gov](mailto:EBC_Support@uspto.gov).

AC/February 1, 2005

A handwritten signature in black ink, appearing to read "Alonzo Chambliss", with a stylized flourish at the end.

Alonzo Chambliss  
Patent Examiner  
Art Unit 2814